

Unit 1 Test Review Sheet  
CP Physics

1. Motion graphs:

- a. Displacement v. time.
  - i. Function may contain curves, lines with slope, and horizontal lines.
  - ii. Function may not double back on itself (must always continue with time).
- b. Velocity v. time.
  - i. Find function by taking slopes of tangent lines at points on the function in the displacement v. time graph.
  - ii. May have vertical asymptotes if function in displacement v. time graph has a cut, corner, or jump (is not continuous at a point).
- c. Acceleration v. time.
  - i. Find function by taking slopes of tangent lines at points on the function in the velocity v. time graph.
  - ii. May have vertical asymptotes if function in displacement v. time graph has a cut, corner, or jump (is not continuous at a point).
- d. If given a displacement v. time and asked to go to velocity v. time or velocity v. time and asked to go to acceleration v. time, use the chart below.

<b>Initial Graph Shape (on either d v. t or v v. t)</b>	<b>Mapping Graph Shape (on either v v. t or a v. t)</b>
Curve	Line with slope
Line with slope	Line with 0 slope (Horizontal line)
Line with 0 slope (Horizontal line)	Horizontal line on time axis

- e. If given a velocity v. time and asked to go to a displacement v. time or an acceleration v. time and asked to go to velocity v. time, use the chart below.

<b>Initial Graph Shape (on either v v. t or a v. t)</b>	<b>Mapping Graph Shape (on either d v. t or v v. t)</b>
Line with slope	Curve
Line with 0 slope (Horizontal line)	Line with slope
Horizontal line on time axis	Line with 0 slope (Horizontal line)

## 2. One-Dimensional Motion:

- a. Variables (units): Time (seconds: s), displacement (meters: m), initial velocity (meters per second: m/s), final velocity (m/s), acceleration (meters per second squared: m/s/s).
- b. Equations: See notes.
- c. Use kinematics equations to solve for unknown variable(s). In x-direction, use  $\Delta x$  for change in displacement.
- d. Free-fall: Special case of one-dimensional motion in y-direction. Use  $\Delta y$  for change in displacement, and the magnitude of the acceleration (the acceleration due to gravity) is equal to 9.8 m/s/s. The velocity of the object at the maximum height is equal to 0 m/s.
- e. Definitions we get to choose are our coordinate system (whether up or down and left or right are positive) and the zero point for our displacement. Use what you know about the particular problem to make good choices for your coordinate system and zero point.